

Serial No. 09/716,543
Docket No. ALF 005 PA

Listing of Claims:

Claim 1 (original): A method for forming a domed aerosol can end from a sheet of material in a press having a fixed base and a movable punch assembly, said method comprising the steps of:

- pull
R/B1*
- blanking a workpiece from said sheet of material;
 - holding said workpiece between a blank punch carried by said punch assembly and a draw pad carried by said base;
 - holding said workpiece between a knockout carried by said punch assembly and a crown ring carried by said base;
 - advancing said blank punch and said draw pad to form an outer crown lip around the periphery of said workpiece;
 - advancing an outer redraw sleeve, carried by said punch assembly, to form an outer portion of a dome of said domed aerosol can end between said redraw sleeve and a dome form die on said base, said knockout and said crown ring holding said workpiece to control the flow of material into said outer portion of said dome;
 - advancing a dome punch to form an inner portion of said dome with said dome form die, said knockout and said crown ring holding said workpiece to control the flow of material into said inner portion of said dome, said outer crown lip shortening in accordance with said flow of material; and
 - collapsing said dome form die to form a crown for said domed aerosol can end.
- AS*

Claim 2 (original): A method for forming a domed aerosol can end as claimed in claim 1 further comprising the step of holding said outer portion of said dome between said redraw sleeve and said dome form die to control the flow of material into said inner portion of said dome as said dome punch advances to form said inner portion of said dome.

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Claim 3 (original): A method for forming a domed aerosol can end as claimed in claim 1 wherein said steps of advancing an outer redraw sleeve and advancing a dome punch are performed to substantially completely form said outer portion of said dome before said dome punch contacts said workpiece.

Claim 4 (original): A method of forming a domed aerosol can end from a sheet of material in a press having a fixed base and a movable punch assembly, said method comprising the steps of:

initially forming a dome of said domed aerosol can end; and
then forming a crown of said domed aerosol can end.

Claim 5 (original): A method of forming a domed aerosol can end as claimed in claim 4 wherein said step of forming a dome of said domed aerosol can end comprises the steps of:

blanking a workpiece from said sheet of material;
holding said workpiece between a blank punch carried by said punch assembly and a draw pad carried by said base;
holding said workpiece between a knockout carried by said punch assembly and a crown ring carried by said base;
advancing said blank punch and said draw pad to form an outer crown lip around the periphery of said workpiece;
advancing an outer redraw sleeve and a dome punch, both carried by said punch assembly, to form an outer portion of said dome of said domed aerosol can end between said outer redraw sleeve and a dome form die; and
advancing said dome punch to form an inner portion of said dome with said dome form die, said knockout and said crown ring holding said workpiece to control the flow of material into said inner portion of said dome, said outer crown lip shortening in accordance with said flow of material.

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Claim 6 (original): A method of forming a domed aerosol can end as claimed in claim 5 further comprising the step of forming a crown of said domed aerosol can end.

Claim 7 (original): A method of forming a domed aerosol can end as claimed in claim 6 wherein said step of forming a crown of said domed aerosol can end comprises the step of collapsing said dome form die.

Claim 8 (original): A method for forming a domed aerosol can end as claimed in claim 6 wherein said step of forming a dome of said domed aerosol can end further comprises the step of holding said outer portion of said dome between said outer redraw sleeve and said dome form die to control the flow of material into said inner portion of said dome as said dome punch advances to form said inner portion of said dome.

Claim 9 (original): A method of forming a domed aerosol can end as claimed in claim 8 wherein said step of forming a crown of said domed aerosol can end comprises the step of collapsing said dome form die.

Claim 10 (original): A method for forming a dome of a domed aerosol can end from a workpiece blanked from a sheet of material in a press having a fixed base and a movable punch assembly, said method comprising the steps of:

holding said workpiece between a knockout carried by said punch assembly and a crown ring carried by said base;

advancing an outer redraw sleeve and a dome punch, both carried by said punch assembly, to form an outer portion of said dome of said domed aerosol can end between said outer redraw sleeve and a dome form die; and

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advancing said dome punch to form an inner portion of said dome with said dome form die, said knockout and said crown ring holding said workpiece to control the flow of material into said inner portion of said dome.

Claim 11 (original): A method for forming a dome of a domed aerosol can end as claimed in claim 10 further comprising the step of holding said outer portion of said dome between said outer redraw sleeve and said dome form die to control the flow of material into said inner portion of said dome as said dome punch advances to form said inner portion of said dome.

Claim 12 (currently amended): Apparatus for forming a domed aerosol can end from a sheet of material in a press having a fixed base and a movable punch assembly, said apparatus comprising:

a blank punch carried by said punch assembly;

a crown ring draw pad carried by said base, said crown ring draw pad being opposite said blank punch for holding a workpiece during formation of said domed aerosol can end;

an outer redraw sleeve carried by said punch assembly;

a dome punch carried by said punch assembly;

a dome form die mounted on said base, said outer redraw sleeve forming an outer first portion of a dome for said domed aerosol can end with said dome form die prior to said dome punch forming a second inner portion of said dome with said dome form die.

Claim 13 (original): Apparatus for forming a domed aerosol can end as claimed in claim 12 wherein said outer redraw sleeve together with said dome form die hold said workpiece as said dome punch forms said second portion of said dome of said domed aerosol can end.

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Claim 14 (original): Apparatus for forming a domed aerosol can end as claimed in claim 12 further comprising means for collapsing said dome form die after said dome is formed to form a crown of said domed aerosol can end.

Claim 15 (currently amended): Apparatus for forming a domed aerosol can end from a sheet of material in a press having a fixed base and a movable punch assembly, said apparatus comprising:

a ~~blank punch~~ knockout carried by said punch assembly;

a crown ring carried by said base, said crown ring being opposite said ~~blank punch~~ knockout for holding a workpiece during formation of said domed aerosol can end;

an outer redraw sleeve carried by said punch assembly;

a dome punch carried by said punch assembly;

a dome form die mounted on said base, said outer redraw sleeve forming an outer first portion of a dome for said domed aerosol can end with said dome form die and, together with said dome form die, holding said workpiece as an inner second portion of said dome is formed by said dome punch with said dome form die.